CLAIMS

We claim:

5   1.   A method comprising:

(a)   receiving a request to establish a circuit-data session between a user terminal and a specified destination;

(b)   responsively (i) setting up a packet-data session between the user terminal and a translation node, (ii) setting up a circuit-data session between the translation node and the

10   specified destination, and (iii) bridging the packet-data session with the circuit-data session.

2.   The method of claim 1, wherein receiving the request comprises receiving the request at the user terminal.

15   3.   The method of claim 2, wherein the request defines a telephone number of the specified destination, the method further comprising:

communicating the telephone number to the translation node,

wherein, setting up the circuit-data session between the translation node and the specified destination comprises the translation node placing a circuit-switched call to the telephone

20   number.

4.   The method of claim 3, wherein the request further defines user-account information, the method further comprising:

communicating the user-account information to the translation node;

25   communicating the user-account information from the translation node to the specified destination.

5.   The method of claim 1, wherein the user terminal comprises a mobile station, and the specified destination comprises a dial-up server.

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6.   The method of claim 1, wherein setting up the packet-data session between the user terminal and the translation node comprises setting up the packet-data session over a communication path comprising an air interface.

7.   The method of claim 6, wherein setting up the packet-data session between the user terminal and the translation node comprises the user terminal sending an origination message over the air interface to a radio access system, the origination message including a packet-data service code.

8.   The method of claim 6, wherein setting up the packet-data session between the user terminal to the translation node comprises:

setting up a PPP session between (i) the user terminal and (ii) an entity that is arranged to forward packets of the session to the translation node.

9.   The method of claim 6, wherein each of a plurality of packets sent from the user terminal to the translation node in the packet-data session includes an identifier, and wherein setting up the packet-data session between the user terminal and the translation node comprises:

setting up a PPP session between (i) the user terminal and (ii) an entity that is arranged to forward each packet to the translation node in response to a determination that the packet includes the identifier.

10.   The method of claim 9, further comprising programming the entity to forward to the translation node each packet that includes the identifier.

11.   The method of claim 9, wherein the identifier comprises a predetermined network address.

12.   The method of claim 1, wherein receiving the request comprises receiving the request from a user, the method further comprising:

performing step (b) transparently to the user.

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13.   A method comprising:

receiving into a user terminal a request to establish a dial-up data session between the user terminal and a dial-up data server, the dial-up data session defining data to be communicated between the user terminal and the dial-up data server;

packetizing outgoing data at the user terminal, to produce outgoing packetized data;

transmitting the outgoing packetized data from the user terminal to a translation node;

placing a circuit-switched call from the translation node to the dial-up data server;

translating the outgoing packetized data into an outgoing dial-up data stream at the translation node; and

in the call, sending the outgoing dial-up data stream from the translation node to the dial-up data server.

14.   The method of claim 13, wherein the outgoing packetized data comprises a sequence of packets and the dial-up data stream comprises a digital bit stream, and wherein translating the outgoing packetized data into an outgoing dial-up data stream comprises:

embedding the packets in the digital bit stream.

15.   The method of claim 13, wherein the outgoing packetized data comprises a sequence of packets, each including a header and payload, wherein the dial-up data stream comprises a digital bit stream, and wherein translating the outgoing packetized data into an outgoing dial-up data stream comprises:

depacketizing the packets to uncover the payload of each packet; and

including the payload of the packets in the digital bit stream.

16.   The method of claim 13, further comprising:

in the call, receiving an incoming dial-up data stream at the translation node from the dial-up data server;

packetizing the incoming dial-up data stream at the translation node, to produce incoming packetized data;

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transmitting the incoming packetized data from the translation node to the user terminal; and

depacketizing the incoming packetized data at the user terminal.

5   17.   The method of claim 16, wherein transmitting the incoming packetized data from the translation node to the user terminal comprises:

transmitting the incoming packetized data from the translation node to an entity that is arranged to forward the incoming packetized data to the user terminal.

10   18.   The method of claim 17, wherein the entity comprises a PDSN.

19.   The method of claim 16, wherein transmitting the incoming packetized data from the translation node to the user terminal comprises:

transmitting the incoming packetized data from the translation node to the user terminal

15   along a communication path comprising a home agent of the user terminal.

20.   The method of claim 13, wherein the request to establish a dial-up data session between the user terminal and a dial-up data server defines a telephone number of the dial-up data server, and wherein placing a circuit-switched call from the translation node to the dial-up

20   data server comprises:

placing a circuit-switched call from the translation node to the telephone number of the dial-up data server.

21.   The method of claim 20, further comprising:

25   sending the telephone number from the user terminal to the translation node.

22.   The method of claim 13, wherein the request to establish a dial-up data session between the user terminal and a dial-up data server defines user-account information, the method further comprising:

30   sending the user-account information from the user terminal to the translation node; and

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in the call, sending the user-account information from the translation node to the dial-up data server.

23.   The method of claim 22, wherein the user-account information comprises a username and a password.

24.   The method of claim 13, further comprising:

including, in each packet of the outgoing packetized data, a predetermined identifier,

wherein, transmitting the outgoing packetized data from the user terminal to a translation node comprises transmitting each packet of the outgoing packetized data from the user terminal to an entity that is arranged to detect the predetermined identifier in the packet and to responsively forward the packet to the translation node.

25.   The method of claim 24, wherein transmitting each packet of the outgoing packetized data from the user terminal to the entity comprises transmitting each packet in a PPP session between the user terminal and the entity.

26.   The method of claim 25, wherein transmitting each packet of the outgoing packetized data from the user terminal to the entity comprises transmitting each packet over an air interface between the user terminal and a base station.

27.   The method of claim 24, further comprising:

providing the entity with logic to detect the predetermined identifier in the packet and to responsively forward the packet to the translation node.

28.   The method of claim 13, further comprising:

using a network access server as the translation node.

29.   In a network of the type comprising an access link for communicatively coupling user terminals with an access node, wherein the access node provides connectivity with a

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plurality of destinations including packet-terminated destinations and circuit-terminated destinations, and wherein communications from a user terminal to a packet-terminated destination, when carried over the access link, are carried over the access link at a first service level, and communications from a user terminal to a circuit-terminated destination, when carried

5   over the access link, are carried over the access link at a second service level different than the first service level, a method comprising:

receiving a user request to establish a communication session from a user terminal to a specified circuit-terminated destination;

in response to the user request, (i) setting up a first session from the user terminal to an

10   intermediate packet-terminated destination via a communication path including the access link, so that the first session is carried over the access link at the first service level, (ii) setting up a second session from the intermediate packet-terminated destination to the specified circuit-terminated destination, and (iii) bridging the first session with the second session to produce an end-to-end session from the user terminal to the specified destination.

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30.   The method of claim 29, wherein the access link comprises an air interface.

31.   The method of claim 29, wherein the user terminal comprises a mobile station and the access node comprises a base station.

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32.   The method of claim 31, wherein the user terminal further comprises a host device linked with the mobile station.

33.   The method of claim 29, wherein the first service level comprises a first data rate

25   for communication over the access link, and the second service level comprises a second data rate for communication over the access link, the first data rate being higher than the second data rate.

34.   The method of claim 29, wherein the user request to establish a communication

30   session from a user terminal to the specified circuit-terminated destination comprises a request to

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establish a dial-up data connection from the user terminal to a telephone number of the specified circuit-terminated destination.

35.   The method of claim 34, further comprising receiving the user request at the user terminal.

36.   The method of claim 35, wherein setting up the first session from the user-terminal to the intermediate packet-terminated destination comprises:

sending an origination message from the user terminal to the access node.

37.   The method of claim 36, further comprising:

sending the telephone number of the specified circuit-terminated destination from the user terminal to the access node; and

sending the telephone number of the specified circuit-terminated destination from the access node to the intermediate packet-terminated destination.

38.   The method of claim 34, wherein setting up the second session from the intermediate packet-terminated destination to the specified circuit-terminated destination comprises:

the intermediate destination placing a dial-up call to the telephone number.

39.   The method of claim 38, wherein the user request defines user-account information, the method further comprising:

sending the user-account information from the user terminal to the access node;

sending the user-account information from the access-node to the intermediate packet-terminated destination; and

sending the user-account information from the intermediate packet-terminated destination to the specified circuit-terminated destination.

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40. The method of claim 39, wherein the user account information comprises a username and a password.

41. In a network of the type comprising an access link for communicatively coupling user terminals with an access node, wherein the access node provides connectivity with a plurality of destinations, and wherein packet-data sessions, when carried over the access link, are carried over the access link at a first service level, and circuit-data sessions, when carried over the access link, are carried over the access link at a second service level different than the first service level, a method comprising:

receiving a user request to establish a circuit-data session between a user terminal and a specified destination;

responsive to the user request, (i) establishing a packet-data session between the user terminal and an intermediate entity, (ii) establishing a circuit-data session between the intermediate entity and the specified destination, and (iii) bridging the packet-data session with the circuit-data session, so as to establish an end-to-end session between the user terminal and the specified destination.

42. The method of claim 41, wherein the access link comprises an air interface, and the user terminal communicates wirelessly over the access link.

43. The method of claim 41, wherein the specified destination comprises a dial-up server accessible at a telephone number, and the user request comprises a request to establish a dial-up data session to the telephone number.

44. The method of claim 41, wherein the user request defines a telephone number of the specified destination, the method further comprising:

communicating the telephone number from the user terminal to the intermediate entity.

45. The method of claim 44, wherein establishing the circuit-data session between the intermediate entity and the specified destination comprises:

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the intermediate entity placing a circuit-switched call to the telephone number.

46.   The method of claim 44, wherein the user request further defines user-account information, the method further comprising:

communicating the user-account information from the user terminal to the intermediate entity; and

communicating the user-account information from the intermediate entity to the specified destination.

47.   A system comprising a user terminal including:

a first processor;

a first data storage mechanism;

a first communication interface for communicating over an air interface;

a first user-input means for receiving a user request to establish a dial-up data session with a specified circuit-terminated destination,

a first set of instructions stored in the first data storage mechanism and executable by the first processor, in response to the user request, (i) to send a session-setup message via the air interface requesting establishment of a packet-data session and (ii) once the packet-data session is established, to send packets that include dial-up data as payload and that include a predetermined identifier associated with a dial-up data session.

48.   The system of claim 47, further comprising a translation node including:

a second processor;

a second data storage mechanism;

a second communication interface for receiving packet-data, the second communication interface receiving the packets and providing the packets to the second processor;

a third communication interface for sending circuit-data; and

a second set of instructions stored in the second data storage mechanism and executable by the second processor (i) to translate the packets into outgoing circuit-data and (ii) to provide

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the outgoing circuit-data to the third communication interface for transmission of the outgoing circuit-data to the specified circuit-terminated destination.

49. The system of claim 48, further comprising an entity including:

a third processor;

a third data storage mechanism;

a fourth communication interface for communicating packet-data, the fourth communication interface receiving the packets and providing the packets to the third processor;

a third set of instructions stored in the third data storage medium and executable by the third processor, for each packet, to detect the predetermined identifier in the packet and to responsively send the packet to the translation node.

50. The system of claim 49, wherein the entity is a PDSN.

51. A system comprising:

a processor;

data storage;

a first communications interface for communicating packet-data, the first communications interface receiving packets representing dial-up data from a mobile station and providing the packets to the processor;

a second communications interface for communicating circuit-data, the second communications interface receiving a dial-up data stream from the processor and sending the dial-up data stream to a dial-up server; and

instructions stored in the data storage and executable by the processor to translate the packets into the dial-up data stream.

52. The system of claim 51, further comprising:

a packet-router arranged to route packets to the first communications interface in response to a determination, per packet, that the packet includes an identifier indicative of a dial-up data session.

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53. A system for providing a dial-up data session between a user terminal and a remote access server, the system comprising:

means for establishing a packet-data session between the user terminal and a translation node, via a communication path including an air interface;

means for establishing a circuit-data session between the translation node and the remote access server; and

means for bridging the packet-data session and the circuit-data session.

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